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One major problem in education has been to find a method for classifying students that would result in the greatest possible gains for the students and facilitate the best teaching techniques. Educators seeking answers to this problem have experimented with dividing classes into groups of a more homogeneous nature, usually on the basis of intelligence or achievement test scores.

About thirty different experiments in ability grouping with and without a control group of heterogeneous grouping, at the elementary, junior high, and senior high school levels for students of slow, average, and rapid learning ability are reported. In some studies researchers tried to keep the method of instruction constant by using the same teachers for all sections, both homogeneous and heterogeneous classes. Others made deliberate attempts to adjust the course content, materials, and methods to levels appropriate for each section.

It can be concluded that controlled experimental studies comparing the effectiveness of homogeneous and heterogeneous grouping, as evaluated by student achievement, showed a great variety of experimental designs and no consistent pattern of results. Many experiments failed to control the type of teaching and to provide differentiation according to ability levels. Others overlooked motivational factors and attempted to control only a few of the possible variables affecting the learning situation. In experiments that provided for differentiation of teaching methods and materials, and attempted to push the bright homogeneous classes, results tended to favor the homogeneous over the heterogeneous groups.

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RUTH B. EKSTROM
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Experimental Studies of Homogeneous Grouping: A Critical Review

One major problem in education has been to find a method for classifying students that would result in the greatest possible gains for the students and, at the same time, facilitate the best teaching techniques. Educators searching for an answer to this problem have experimented with dividing classes into groups of a more homogeneous nature, usually on the basis of some measure of intelligence or achievement.

Some educators have strongly recommended homogeneous grouping on the basis of ability, though others have opposed it. James B. Conant has recommended ability grouping in required high-school subjects and in subjects elected by students with a wide range of ability (2). It may be argued, however, that ability grouping alone cannot insure improved achievement, which is one of the major gains desired from this technique. What evidence does research present to help teachers and administrators evaluate the effectiveness of homogeneous grouping?

A review by Henry J. Otto states that the evidence slightly favors the use of ability grouping, particularly where standards, materials, and methods are adapted to the group (3). According to Otto, the greatest relative effectiveness of homogeneous grouping is indicated for dull children, the next greatest for average children, and the least benefit and frequent harm occur for bright children. Other

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Experimental Studies of Homogeneous Grouping: A Critical Review

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reviewers have felt that the experimental evidence used to compare homogeneous and heterogeneous grouping has been inadequate, but they have pointed out the importance of adapting teaching methods and curriculum to the pupils (4, 5, 6, 7, 8).

In this review of some of the major studies of homogeneous grouping, only research involving experimental controls will be discussed. These studies usually compare the achievement of an experimental group of students in homogeneously grouped classes with the achievement of a control group of students of equal ability in heterogeneously grouped classes.

Several experimental studies reported specific attempts to keep the content of the courses and the methods and the materials used the same in all groups and at all levels of ability. This procedure would, of course, tend to defeat the purpose of grouping, which is to make it possible to deal more efficiently with individual differences. Many of these experiments were conducted more than thirty years ago at a time when the idea of adapting teaching to individual differences was comparatively new. However, unless teachers in these experiments made adaptations to the needs of their classes despite instructions to the contrary, it would be unlikely that the results would show much difference between the groups.

Purdom concluded from his study of grouping that high-school students in homogeneous sections do not gain more than students in heterogeneous sections when results are measured by standardized achievement tests (9). He did not tell the teachers which were experimental or control groups. Nor did he give teachers information on the ability level of the homogenous groups, thus hampering adaptation of teaching. Worlton found that elementary-school pupils in homogeneous classes made greater gains in knowledge than pupils in heterogeneous groups (10). He reported that the time allotted for instruction in each section, the content of the courses, and the methods used for instruction were identical in each section. However, since the author noted that grouping permitted more effective teaching, some adaptations may have developed spontaneously. Mar-

tin found that slow and superior pupils in junior high school achieved more in homogeneous groups, but children of average ability did better in heterogeneous groups (11). He also instructed the teachers to use the same methods with all sections. Bonar concluded that first-graders made the greatest progress in mixed rather than homogeneous groups, but he also reports that teachers used the same materials for all pupils (12).

In some studies researchers tried to keep the method of instruction constant by using the same teachers for all sections, homogeneous as well as well as heterogeneous. The amount of adaptation, if any, was usually determined by the individual teacher. Since no instructions were given to aid the teacher in making the necessary adaptations, only slight provision for attention to individual differences was found. Again, it is necessary to point out that at the time some of these experiments were carried out, relatively few classroom teachers were aware of the necessity of adapting instruction to the individual.

Cook found that superior high-school students made greater progress in history and less in geometry in homogeneous groups, while slow learners made greater progress in geometry and less in history in homogeneous groups (13). There was little difference between the groups in English. The same teachers met all sections and were instructed to use the methods they ordinarily used. Woody compared students in high-school English classes and found no advantage for either homogeneous or heterogeneous groups (14). The same teachers taught all sections and, although they were instructed to adjust the rate of presentation for most effective teaching, no other curriculum adjustments are mentioned. Billett compared the achievement of ninth-grade English students in homogeneous and heterogeneous classes (15). He found no statistically significant differences between groups, although homogeneous grouping seemed most effective for dull students and least effective for superior students. The same teachers met all sections and were free to make spontaneous adaptations of methods to the groups, but no instructions were given for differentiation of methods and materials. Holy and

Sutton had the same teacher meet all sections of ninth-grade algebra classes and found that differences in gains according to standard tests favored the homogeneous groups over the control groups (16). Breidenstine found homogeneous and heterogeneous groups about equal in achievement on a standardized test though there was a slight tendency to favor the heterogeneous group (17). He mentions teaching as a limiting variable in this study. No check was available on curriculum adaptations made because of grouping.

Studies where deliberate attempts were made to adjust the course content, materials, and methods to levels appropriate to each of the sections tend to favor homogeneous grouping.

Burtt, Chassel, and Hatch compared groups of students in a college course in elementary psychology (18). At the end of one semester there was no difference between experimental and control groups. Teaching techniques were then changed, and an attempt was made to push the homogeneous, bright class. This procedure resulted in a gain for this group at the end of the second semester. Shields studied the relationship of homogeneous grouping to reading achievement and found that the experimental group gained more than the control group in reading rate and comprehension (19). Ullrich found no advantage for homogeneous grouping in college classes until content was enriched and the rate of progress changed (20). After these changes the superior-ability homogeneous section showed a decided advantage over the comparable control group.

Rankin found that slow and average learners in seventh grade achieved more in homogeneous classes, while the faster students did better in heterogeneous groups (21). Though he used the same teachers for all sections, it was suggested that the teachers adjust their methods, course content, and standards to the group. A study of elementary-school pupils by Barthelmess and Boyer showed achievement for homogeneous groups to be significantly greater than for heterogeneous groups (22). Provisions were made for curriculum adjustment by outlining minimum courses and by suggesting differences in teaching methods for bright and dull groups. Rankin, Ander-

sen, and Bergman compared the results achieved by elementary-school pupils under two plans of homogeneous grouping with those achieved under mass-instruction methods (23). Both types of homogeneous grouping, which provided for differentiation of methods and materials among the groups, proved superior to heterogeneous grouping, which used mass instruction with no provision for differentiation. Russell compared reading achievement in an experimental inter-classroom grouping plan with reading achievement in control classes and found no reliable differences in performance on a standardized test (24). It should be noted, however, that the control classes in each grade were formed into classroom reading groups already quite homogeneous in nature. Severson found that homogeneous grouping of junior high school pupils based on reading comprehension resulted in better growth in reading comprehension, vocabulary, mechanics of English, and spelling as measured by a standardized test. In the study, scores of the experimental group were compared with scores of a heterogeneous control group (25). The experimental group also received better academic marks.

By organizing special, separate, homogeneously grouped classes for children of superior intelligence, teachers and administrators planned to allow for maximum adaptation of instruction appropriate to this level. Catherine Miles (26) and A. H. Passow (27) both stated that comparisons of gifted students in regular and special classes showed that progress was more favorable in homogeneous classes. This finding would seem to be in disagreement with the conclusions in Otto's review (3). Several studies of gifted children were confounded in that the standardized tests used were not suited to the group. Because of their special ability the students scored well beyond the level where the tests were appropriate measures. It has also been observed that classes for the gifted are enriched with many additional subjects. Most standardized tests do not measure achievement in these subjects.

Jones and McCall matched children who had been in accelerated classes for two years with other bright children who had remained

in regular classes (28). The average educational age of the pupils in the accelerated classes was found to be slightly higher than that of the pupils in the regular classes, though the difference was not statistically significant. VanWagenen found that homogeneous grouping of superior pupils in junior high school did not result in higher achievement (29). He explained that this finding was probably due to the fact that the special classes were not given more difficult work to do. Thus, though there was opportunity to devise an enriched curriculum for this high-ability group, no adaptations were made. Worlton found it a slight advantage for above-average elementary-school pupils to be in homogeneous groups (30). However, Dvorak and Rae found no clear-cut gains beyond those of the control group for an experimental group of superior first-grade children in a homogeneous class (31). Gray and Hollingworth compared the achievement of gifted children in special classes with the achievement of other gifted children placed in heterogeneous classes (32). The special classes studied French, biography and the history of civilization in addition to the regular curriculum, and did extra work in science, mathematics, English composition, and music. The children's scores on a standardized achievement test revealed no statistically significant differences in tool subjects. Apparently no attempt was made to measure the effects of the enriched curriculum content. Leighton found that students of high ability showed significantly greater achievement than a control group when placed in competition with one another in homogeneous classes rather than with students of a wide range of ability in heterogeneous classes (33).

Morgan compared the work of a special seminar group in educational psychology with the work of comparable high-ability students in regular classes (34). The experimental group, which elected to take the seminar, was found to be initially superior to the control group that did not take the seminar. The experimental group retained its position of superiority. Herr compared a group of superior students who had taken an accelerated junior high school program with other superior students who entered ninth grade at the same time

(35). When the high-school scholastic achievement of the groups was compared, no outstanding differences were found, but more differences favored those who had been in the homogeneous group. Nelson and Carlson, however, found that the placement of elementary-school pupils of superior intelligence in a special class did not appreciably affect scores on standardized tests (36). Justman compared two matched groups of gifted junior high school students (37). He concluded that the segregation of gifted children in special rapid-progress classes is accompanied by academic achievement that is significantly superior to that attained by matched pupils in classes that progress at normal rate. The achievement was accomplished with no detriment to social acceptance, interests, attitudes, and aspects of personality. Parker found that curriculum enrichment for superior students in homogeneous classes in elementary and secondary school proved beneficial at all levels; at the high-school level the difference was statistically significant (38). Westmayer compared the achievement of superior high-school students who selected an advanced-problems class in science with the achievement of students of similar ability in heterogeneously grouped biology classes (39). The mean raw score of the experimental group on a standardized natural-science test was shown to be significantly higher than of the control group.

These studies on the effectiveness of homogeneous grouping fail to show any great consistency in the findings. The experimental results differ greatly because of the wide variety of experimental conditions, methods, and purposes. Few studies have much in common in content, method, or type of subjects used.

In these studies few attempts were made to control more than a few of the possible variables affecting the learning situation. Few of the experimenters took into consideration the possibility that factors other than grouping could influence the test scores. In many cases, the experiments were too brief in duration to permit significant changes to be observable. The use of matched pairs of students is often a weak technique since the equating is usually based only on

intelligence or achievement, while motivational factors that may have prompted some students to enter special or experimental classes and influenced others to remain with the usual group are overlooked. Several studies used only a test of general scholastic aptitude to section classes, although it is usually considered more appropriate to combine this information with knowledge of pupils' achievement in each subject and to use the combined information as the basis for grouping.

French has discussed the weakness of using available data, rather than setting up an experimental plan (40). To equate homogeneous and heterogeneous groups only after learning has taken place results in an experiment of little value and little applicability to the actual learning situation.

The major deficiency in most of these experiments that compared homogeneous and heterogeneous grouping is failure to provide for differentiation of course content and method according to level of ability. The very fact that a control group is introduced can put limitations on the adaptation of the curriculum to ability groups. However, results favoring homogeneous grouping were strongly evident in experiments that specifically provided for differentiation of methods and materials according to the students' ability and made an effort to push bright, homogeneous classes.

In summary, it can be concluded that controlled experimental studies comparing the effectiveness of homogeneous and heterogeneous grouping, as evaluated by student achievement, showed a great variety of experimental designs and no consistent pattern of results. Many experiments failed to control the type of teaching and to provide differentiation of teaching according to ability levels. Poor experimental design, such as the use of available data only and the use of matched pairs of subjects on unwarranted assumptions of similarity, made many studies less effective.

In experiments that specifically provided for differentiation of teaching methods and materials for groups at each ability level, and made an effort to push bright homogeneous classes, results tended to favor the homogeneous groups.

REFERENCES

1. This project was supported by funds from Office of Naval Research Contract Nonr–2214 (00).

2. J. B. Conant, *The American High School Today* (New York: McGraw-Hill Book Co., 1959), 49–50.

3. H. J. Otto, "Homogeneous Grouping," in W. Monroe (ed.), *Encyclopedia of Educational Research* (New York: Macmillan Co., 1950), 376–78; see also H. J. Otto, *Elementary School Organization and Administration* (New York: Appleton-Century-Crofts, 1954), 201–2.

4. R. T. Rock, Jr., "A Critical Study of Current Practices in Ability Grouping," *Educational Research Bulletin* (Catholic University of America), IV, Nos. 4 and 5 (1929).

5. P. Rankin, "Pupil Classification and Grouping," *Review of Educational Research*, I (1931), 200–230.

6. A. H. Turney, "Status of Ability Grouping," *Educational Administration and Supervision*, XVII (1931), 21–42, 110–27.

7. R. O. Billett, *Provisions for Individual Differences, Marking and Promotion* (Bulletin 1932, No. 17, Monograph 13 [Washington: U.S. Office of Education, 1932]).

8. Ethel L. Cornell, "Effects of Ability Grouping Determinable from Published Studies," in *The Grouping of Pupils*, Thirty-fifth Yearbook of the National Society for the Study of Education, Part I (Chicago: Distributed by the University of Chicago Press, 1936), 289–302.

9. T. L. Purdom, "A Scientific Study To Determine the Value of Homogeneous Grouping Made on the Basis of Intelligence Tests" (Unpublished doctoral thesis, University of Michigan, 1924); see also T. L. Purdom, *Value of Homogeneous Grouping* (Baltimore: Warwick & York, 1929).

10. J. T. Worlton, "The Why of Homogeneous Classification," *Elementary School Journal*, XXVII (1926), 265–74.

11. W. H. Martin, "The Results of Homogeneous Grouping in the Junior High School" (Unpublished doctoral thesis, Yale University, 1927).

12. H. S. Bonar, "Ability Grouping in the First Grade," *Elementary School Journal*, XXIX (1929), 703–6.

13. R. R. Cook, "A Study of the Results of Homogeneous Grouping of Abilities in High School Classes," in *The Education of Gifted Children*, Twenty-third Yearbook of the National Society for the Study of Education, Part I (Chicago: Distributed by the University of Chicago Press, 1924), 302–12.

14. C. Woody, *Results Obtained from Ability Grouping* (Bureau of Educational Reference and Research Bulletin, No. 72 [Ann Arbor: University of Michigan, 1924]).

15. R. O. Billett, "A Controlled Experiment To Determine the Advantages

of Homogeneous Grouping," *Educational Research Bulletin* (Ohio State University), VII (1928), 133–40, 165–72, 190–96.

16. T. C. Holy and D. H. Sutton, "Ability Grouping in the Ninth Grade," *Educational Research Bulletin* (Ohio State University), IX (1930), 419–22.

17. A. G. Breidenstine, "The Educational Achievement of Pupils in Differentiated and Undifferentiated Groups," *Journal of Experimental Education*, V (1936), 91–135.

18. H. E. Burtt, L. M. Chassel, and E. M. Hatch, "Efficiency of Instruction in Unselected and Selected Sections in Elementary Psychology," *Journal of Educational Psychology*, XIV (1923), 154–61.

19. J. M. Shields, "Teaching Reading through Ability Grouping," *Educational Method*, VII (1927), 7–10.

20. O. A. Ullrich, "An Experimental Study in Ability Grouping" (Unpublished doctoral thesis, University of Texas, 1926).

21. P. Rankin, "Evaluation of Ability Grouping in the Seventh Grade" (Unpublished study, Detroit Public Schools, 1927).

22. Harriet Barthelmess and P. Boyer, "An Evaluation of Ability Grouping," *Journal of Educational Research*, XXVI (1932), 284–94.

23. P. Rankin, C. T. Andersen, and W. G. Bergman, "Ability Grouping in the Detroit Individualization Experiment," in *The Grouping of Pupils*, Thirty-fifth Yearbook of the National Society for the Study of Education, Part I (Chicago: Distributed by the University of Chicago Press, 1936), 277–88.

24. D. H. Russell, "Inter-class Grouping for Reading Instruction in the Intermediate Grades," *Journal of Educational Research*, XXXIX (1946), 462–70.

25. O. B. Severson, Jr., "A Study of Academic Achievement and Personal-Social Development of Junior High School Pupils as Affected by Ability Grouping" (Unpublished doctoral thesis, University of Denver, 1956).

26. Catherine C. Miles, "Gifted Children," in L. Carmichael (ed.), *Manual of Child Psychology* (New York: John Wiley & Sons, 1954), 1032.

27. A. H. Passow, "Enrichment of Education for the Gifted," in *Education for the Gifted*, Fifty-seventh Yearbook of the National Society for the Study of Education, Part II (Chicago: Distributed by the University of Chicago Press, 1958), 193–221.

28. V. A. Jones and W. A. McCall, "Application of Two Techniques in Evaluating Some Policies of Dealing with Bright Children," *Teachers College Record*, XXVII (1926), 825–35.

29. M. J. VanWagenen, "Effects of Homogeneous Grouping upon the Quality of Work of Superior Children," *Educational Method*, VI (1927), 240–47.

30. J. T. Worlton, "Effect of Homogeneous Classification on Scholastic Achievement of Bright Pupils," *Elementary School Journal*, XXVIII (1928), 336.

31. A. Dvorak and J. J. Rae, "Comparisons of Achievement of Superior Children in Segregated and Unsegregated First Grade Classes," *Elementary School Journal*, XXIX (1929), 387.

32. H. A. Gray and Leta S. Hollingworth, "The Achievement of Gifted Children Enrolled and Not Enrolled in Special Opportunity Classes," *Journal of Educational Research*, XXIV (1931), 255–61.

33. R. W. Leighton, "Studies To Determine the Relative Achievement at Different Potentiality Levels," *University of Oregon Publications*, Vol. IV, Bulletin 1 (1933).

34. C. L. Morgan, "An Experiment with a Special Class of Superior Undergraduate Students," *Journal of Applied Psychology*, XX (1936), 146–53.

35. W. Herr, "Junior High School Accelerates and Their Peers in Senior High School," *School Review*, XLV (1937), 186–95, 289–99.

36. E. Nelson and Edith Carlson, "Special Education for Gifted Children," *Journal of Exceptional Children*, XII (1945), 6–13, 24.

37. J. Justman, "A Comparison of the Functioning of Intellectually Gifted Children Enrolled in Special Progress and Normal Progress Classes in Junior High School" (Unpublished doctoral thesis, Columbia University, 1953); see also J. Justman, "Academic Achievement of Intellectually Gifted Accelerants and Non-accelerants in Junior High School," *School Review*, LXII (1954), 142–50.

38. C. Parker, "A Measured Experiment with Mentally Advanced Children," *American School Board Journal*, CXXXIII (December, 1956), 23–24.

39. P. Westmayer, "Just Stand Out of the Way!" *School Science and Mathematics*, LVII (1957), 643–46.

40. J. W. French, *Evidence from School Records on the Effectiveness of Ability Grouping* (Office of Naval Research Technical Report [Princeton, New Jersey: Educational Testing Service, March, 1959]).